WHAT IS CLAIMED IS:

1. A solid-state radiation imager, comprising:

a substantially radiation transparent substrate having a first surface and a second surface opposite from the first surface, wherein the first surface is adapted to receive incident radiation;

a scintillator material having a first surface and a second surface opposite from the first surface; and

a pixelated array of photosensitive elements disposed between the substantially radiation transparent substrate and the scintillator material, wherein the pixelated array of photosensitive elements is disposed between the first surface of the scintillator material and the second surface of the substantially radiation transparent substrate.

2. The solid-state radiation imager according to claim 1, wherein the substantially radiation transparent substrate comprises a glass material.

3. The solid-state radiation imager according to claim 2, wherein the glass material comprises quartz.

4. The solid-state radiation imager according to claim 2, wherein the glass material has a thickness that ranges from about 200 microns to about 700 microns.

5. The solid-state radiation imager according to claim 1, wherein the substantially radiation transparent substrate comprises a polymer material.

6. The solid-state radiation imager according to claim 5, wherein the polymer material comprises at least one of polyethylene terepthalate, polyimide, polyether sulfone, polycarbonate and polyetherimide.

7. The solid-state radiation imager according to claim 1, wherein the substantially radiation transparent substrate comprises aluminum oxide.

8. The solid-state radiation imager according to claim 1, wherein the substantially radiation transparent substrate has a transmission that is greater than about 80 perecent.

9. The solid-state radiation imager according to claim 8, wherein the substantially radiation transparent substrate has a transmission that ranges from about 85 percent to about 95 percent.

10. The solid-state radiation imager according to claim 1, wherein the substantially radiation transparent substrate has a thickness that ranges from about 100 microns to about 5000 microns.

11. The solid-state radiation imager according to claim 1, further comprising a protective cover disposed on the second surface of the scintillator material.

12. The solid-state radiation imager according to claim 11, wherein the protective cover comprises a radiation opaque material.

13. The x-ray imager according to claim 11, wherein the radiation opaque material comprises one of Tungsten and Tantalum.

14. An x-ray imager, comprising:

a substantially x-ray transparent substrate having a first surface and a second surface opposite from the first surface, wherein the first surface is adapted to receive incident x-rays;

a scintillator material having a first surface and a second surface opposite from the first surface, wherein the scintillator material is adapted to absorb the incident x-rays received by the substantially x-ray transparent substrate and generate light; and

a pixelated array of photosensitive elements disposed between the substantially x-ray transparent substrate and the scintillator material, wherein the pixelated array of photosensitive elements is disposed between the first surface of the scintillator material and the second surface of the substantially x-ray transparent substrate, and wherein the pixelated array of photosensitive elements is adapted to determine the amount of x-ray energy received by each pixel in the array.

15. The x-ray imager according to claim 14, wherein the substantially x-ray transparent substrate comprises a glass material.

16. The x-ray imager according to claim 15, wherein the glass material has a thickness that ranges from about 200 microns to about 700 microns.

17. The x-ray imager according to claim 14, wherein the substantially x-ray transparent substrate comprises a polymer material comprising at least one of polyethylene terepthalate, polyimide, polyether sulfone, polycarbonate and polyetherimide.

18. The x-ray imager according to claim 14, wherein the substantially x-ray transparent substrate comprises aluminum oxide.

19. The x-ray imager according to claim 14, wherein the substantially x-ray transparent substrate has an x-ray transmission that is greater than about 80 perecent.

20. The x-ray imager according to claim 19, wherein the substantially x-ray transparent substrate has an x-ray transmission that ranges from about 85 percent to about 95 percent.

21. The x-ray imager according to claim 14, wherein the substantially x-ray transparent substrate has a thickness that ranges from about 100 microns to about 5000 microns.

22. The x-ray imager according to claim 14, further comprising a protective cover disposed on the second surface of the scintillator material, wherein the protective cover is adapted to protect the scintillator material.

23. The x-ray imager according to claim 22, wherein the protective cover comprises an x-ray opaque material comprising at least one of Tungsten and Tantalum.

24. A solid-state radiation imager, comprising:

a substantially radiation transparent substrate having a first surface and a second surface opposite from the first surface, wherein the first surface is adapted to receive incident radiation;

a scintillator material having a first surface and a second surface opposite from the first surface;

a pixelated array of photosensitive elements disposed between the substantially radiation transparent substrate and the scintillator material, wherein the pixelated array of photosensitive elements is disposed between the first surface of the scintillator material and the second surface of the substantially radiation transparent substrate; and

a protective cover disposed on the second surface of the scintillator material.

25. The solid-state radiation imager according to claim 24, wherein the substantially radiation transparent substrate comprises at least one of a glass material, a polymer material and aluminum oxide.

26. The solid-state radiation imager according to claim 24, wherein the substantially radiation transparent substrate has a transmission that is greater than about 80 perecent.

27. The solid-state radiation imager according to claim 26, wherein the substantially radiation transparent substrate has a transmission that ranges from about 85 percent to about 95 percent.

28. The solid-state radiation imager according to claim 24, wherein the substantially radiation transparent substrate has a thickness that ranges from about 100 microns to about 5000 microns.

29. A solid-state radiation imager, comprising:

a substantially radiation transparent substrate having a first surface and a second surface opposite from the first surface, wherein the first surface is adapted to receive incident radiation;

a scintillator material having a first surface and a second surface opposite from the first surface;

a pixelated array of photosensitive elements having a first surface and a second surface opposite from the first surface, disposed between the substantially radiation transparent substrate and the scintillator material, wherein the first surface of the pixelated array of photosensitive elements is disposed on the second surface of the substantially radiation transparent substrate; and

a substantially transparent material disposed between the pixelated array of photosensitive elements and the scintillator material, wherein the substantially transparent material is disposed between the first surface of the scintillator material and the second surface of the pixelated array of photosensitive elements.

30. The solid-state radiation imager according to claim 29, wherein the substantially transparent material comprises a silicon-based dielectric.

31. The solid-state radiation imager according to claim 30, wherein the silicon-based dielectric comprises at least one of silicon nitride and silicon oxide.

32. The solid-state radiation imager according to claim 30, wherein the silicon-based dielectric has a thickness that ranges from about 1 micron to about 5 microns.

33. The solid-state radiation imager according to claim 30, wherein the silicon-based dielectric has a thickness that ranges from about 2 microns to about 12 microns.

34. The solid-state radiation imager according to claim 29, wherein the substantially transparent material comprises a polymer material.

35. The solid-state radiation imager according to claim 34, wherein the polymer material comprises at least one of polyimide and para-xylylene.

36. The solid-state radiation imager according to claim 34, wherein the polymer material has a thickness that ranges from about 1.5 microns to about 8 microns.

37. The solid-state radiation imager according to claim 34, wherein the polymer material has a thickness that ranges from about 3 microns to about 20 microns.

38. The solid-state radiation imager according to claim 29, wherein the substantially transparent material has an atomic number that is less than or equal to 14.

39. An x-ray imager, comprising:

a substantially x-ray transparent substrate having a first surface and a second surface opposite from the first surface, wherein the first surface is adapted to receive incident x-rays;

a scintillator material having a first surface and a second surface opposite from the first surface, wherein the scintillator material is adapted to absorb the incident x-rays received by the substantially x-ray transparent substrate and generate light;

a pixelated array of photosensitive elements having a first surface and a second surface opposite from the first surface, disposed between the substantially x-ray transparent substrate and the scintillator material, wherein the first surface of the pixelated array of photosensitive elements is disposed on the second surface of the substantially x-ray transparent substrate, and wherein the pixelated array of photosensitive elements is adapted to determine the amount of x-ray energy received by each pixel in the array; and

a substantially transparent material disposed between the pixelated array of photosensitive elements and the scintillator material, wherein the substantially transparent material is disposed between the first surface of the scintillator material and the second surface of the pixelated array of photosensitive elements, and wherein the substantially transparent material is adapted to shield the pixelated array of photosensitive elements from electrons generated in the scintillator material.

40. The x-ray imager according to claim 39, wherein the substantially transparent material comprises a silicon-based dielectric.

41. The x-ray imager according to claim 40, wherein the silicon-based dielectric comprises at least one of silicon nitride and silicon oxide.

42. The x-ray imager according to claim 40, wherein the silicon-based dielectric has a thickness that ranges from about 1 micron to about 5 microns.

43. The x-ray imager according to claim 40, wherein the silicon-based dielectric has a thickness that ranges from about 2 microns to about 12 microns.

44. The x-ray imager according to claim 39, wherein the substantially transparent material comprises a polymer material.

45. The x-ray imager according to claim 44, wherein the polymer material comprises at least one of polyimide and para-xylylene.

46. The x-ray imager according to claim 44, wherein the polymer material has a thickness that ranges from about 1.5 microns to about 8 microns.

47. The x-ray imager according to claim 44, wherein the polymer material has a thickness that ranges from about 3 microns to about 20 microns.

48. The x-ray imager according to claim 39, wherein the substantially transparent material has an atomic number that is less than or equal to 14.

49. A solid-state radiation imager, comprising:

a substantially radiation transparent substrate having a first surface and a second surface opposite from the first surface, wherein the first surface is adapted to receive incident radiation;

a scintillator material having a first surface and a second surface opposite from the first surface;

a pixelated array of photosensitive elements having a first surface and a second surface opposite from the first surface, disposed between the substantially radiation transparent substrate and the scintillator material, wherein the first surface of the pixelated array of photosensitive elements is disposed on the second surface of the substantially radiation transparent substrate;

a substantially transparent material disposed between the pixelated array of photosensitive elements and the scintillator material, wherein the substantially transparent material is disposed between the first surface of the scintillator material and the second surface of the pixelated array of photosensitive elements; and

a protective cover disposed on the second surface of the scintillator material.

50. The solid-state imager according to claim 49, wherein the substantially transparent material comprises a silicon-based dielectric.

51. The solid-state imager according to claim 50, wherein the silicon-based dielectric comprises at least one of silicon nitride and silicon oxide.

52. The solid-state imager according to claim 50, wherein the silicon-based dielectric has a thickness that ranges from about 1 micron to about 5 microns.

53. The solid-state imager according to claim 50, wherein the silicon-based dielectric has a thickness that ranges from about 2 microns to about 12 microns.

54. The solid-state imager according to claim 49, wherein the substantially transparent material comprises a polymer material.

55. The solid-state imager according to claim 54, wherein the polymer material comprises at least one of polyimide and para-xylylene.

56. The solid-state imager according to claim 54, wherein the polymer material has a thickness that ranges from about 1.5 microns to about 8 microns.

57. The solid-state imager according to claim 54, wherein the polymer material has a thickness that ranges from about 3 microns to about 20 microns.

58. The solid-state imager according to claim 49, wherein the substantially transparent material has an atomic number that is less than or equal to 14.